

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:)	Attorney Docket No. 911568635006
Jon Andersson)	
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Application No.: 09/381,899)	
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Filed: December 16, 1999)	
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For: METHOD AND APPARATUS)	
FOR AUTOMATIC DATA)	
ACQUISITION OF FORMS)	
)	
Examiner: Bieneman, Charles A.)	
)	
Art Unit: 2176)	
)	
Confirmation No.: 4564)	

REMARKS

Claims 1, 2, 4, 5, 8, 9, 10, 13, 14, 15, 18, 19, 21, 22, 25, 26, 27, 30, 31 and 32 remain in the application with claims 1, 4 and 18 being in independent form.

Claims 3, 6, 7, 11, 12, 16, 17, 20, 23, 24, 28, 29 and 33-40 have been previously cancelled or are cancelled here.

Claims 35-40 were objected to for several reasons. All of these claims have been cancelled thereby obviating the objections.

Claims 1-5, 8-10, 13-15, 18-22, 25-27 and 30-32 have been rejected under section 112 in relation to the terms "continuing data acquisition" and "continued data acquisition". Both of these terms have been removed from the independent claims thereby obviating the rejection.

The subject application present an improved system for quickly inputting, recognizing, organizing and storing documents where the documents include not only text but also designs or pictorial representations. For example, in paragraphs 0003 and 0006 the terms and phrases "design", "specifically designed document with a logo type and other visual elements "and" new

design" are mentioned; in paragraph 0021, the terms "logotype" and "colored" are used; and in paragraphs 0026 and 0027 the terms "design", "signs" and "icons" are used.

Sorting documents where those documents have pictorial representations and colors is not disclosed or even suggested by the cited prior patents, U.S. 5,815,704 to Shimotsuji, U.S. 5,293,429 to Pizano et al.; U.S. 5,434,933 to Karnin et al.; U.S. 4,933,979 to Suzuki, et al.; and U.S. 5,877,963 to Leung et al., either individually or in any combination.

The subject application discloses a system for automatic data capture using line map and object map concepts for analyzing lines and designs of any shape or form. Thus, applicant's invention creates line maps that include straight lines as well as straight line elements of curved, hooked or lines of various shapes. The applicant's invention also uses object maps of characters forming objects such as drawings, logos, trademarks, bar codes and the like as comparison information. The approach of line maps and objects maps is different from the approaches disclosed by the cited references.

Shimotsuji collects information about straight lines and character data for making comparisons. Shimotsuji's basic approach is that the same elements of information should not be stored twice or more times in a database when two or more documents are equal. Shimotsuji stores only differentiating information thereby saving storage space and allowing quicker retrieval.

Shimotsuji, however, uses straight lines for comparison. Hence a document containing only non-straight lines would not generate any information for comparison purposes. Documents containing no character information, but having logos, drawings and the like would also fail to provide comparison information. The apparent reason for this is that Shimotsuji uses "bounding rectangles", sizes of rectangles, coordinates and mid-points of lines, etc. to calculate

similarities between documents. In the present application, comparison keys are built up from lines maps and object maps, a very different approach.

Pizano also only uses horizontal and vertical straight lines for comparison. A document having curved lines would not be identified by Pizano. In no part of the method described in the Pizano reference is it indicated or mentioned that only a part of a line be utilized, or a part of an object which in itself is not a line. For example, in section 3.2/col. 5, the Pizano reference describes the use of start coordinates and end coordinates in the formulas to describe a line. In section 3/col. 4, the Pizano reference describes counting the number of lines in a form and using that number to eliminate forms in the matching process. This method would be very difficult to use if line elements were used. In such a circumstance, the minimum thickness of a line would have to be specified in order to determine how many horizontal and vertical lines a particular analytical box would contain. Further, the Pizano reference discloses the use of the sum of all lengths of a line in a form as a discriminator. This would also pose a problem if line elements were to be taken into account. In the subject application disclosure, only the existence of a line element in a predetermined area is of importance.

A typical example of the shortcomings with the Pizano disclosure is shown by reference to section 7.1.2/col. 18 where the Pizano reference takes up the "problem" of figures on a form and describes a method for avoiding counting such objects as lines. The Pizano reference also describes how to merge "line segments" interrupted by other objects into lines. In sections 7.2 and 7.3/cols. 18 and 19, the Pizano reference also describes how to merge line segments created by distortion that should be recognized as a continuous line. In section 3.2/col. 5 the Pizano reference describes a method for comparing line patterns, based on finding the points where horizontal and vertical lines meet. To use the Pizano disclosure to analyze what the present

application describes would give very strange results. Large objects, such as a logo type would generate as many intersection points as there are image points.

In practice images produced by a scanner or fax often contain a fair amount of distortion in that a straight line may become hooked, or a line may become broken. It is, of course, vitally important to the performance of the method described here to deal with these problems in a sophisticated way. The applicant here describes a method that is not so dependent on perfect images and is able to handle a fair amount of distortion without overly expensive processing power and yet still give very good results.

Pizano also discloses the use of "buckets" of equal size to divide the unknown document for analysis and then directly compares line keys. The subject application uses irregular divisions of the unknown document and then counts "hits" in the vertical and horizontal keys. Thus better focus is provided and matching documents is much faster.

The Karnin reference describes a completely manual routine. It is not analogous to the automatic storage of generated form maps according to the subject application.

The Suzuki reference discloses a method that deals only with text and not images. Figure 5 of Suzuki and its related description shows this very clearly. The reading areas are just that, areas where there is text which can be read. This is not comparable to the much more advanced object area list disclosed in the subject application.

The Leung reference does appear to return a predefined number of matches to the user in the context of a document handling and recognition system. But thereafter, all similarities with the disclosures of the subject application cease. Thus, there is no teaching or suggestion that the Leung reference be combined with the Pizano reference.

The present independent claims 1, 4 and 18 all have been amended to include additional limitations. Now, the form map is based on "text, designs and colors" and that all of these features are searched. In claim 4, there is the additional limitation that a line map comprises "vertical and horizontal line elements from objects of any shape on said unknown form." None of the cited references, individually or in any combination include these limitations.

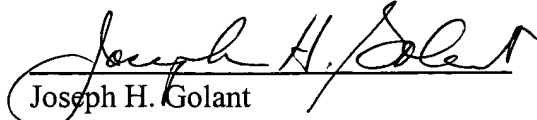
Claims 1 and 18 were rejected under Section 102 based on Shimotsuji, et al. None of the limitations added to claims 1 and 18 (and 4 as well) are included in the teachings of Shimotsuji et al., and therefore Shimotsuji cannot properly be used to anticipate.

Claims 1, 4-5, 8-9, 18, 21-22 and 25-26 were rejected under Section 103 based on Pizano et al. in view of Karnin et al., claims 2-3, 10, 13-14, 19-20, 27 and 30-31 were rejected under section 103 based on Pizano and Karnin as well as Suzuki, and claims 15 and 32 stand rejected under section 103 based on Pizano, Karnin and Leung. As mentioned above, there are no teachings or suggestions in the references that they be combined and even if combined, they do not teach all of the limitations now in the claims. Combining the references as presented is a hindsight reconstruction using the present application for guidance. This is not a proper approach.

The Examiner is also advised that the undersigned has been informed that the method and apparatus disclosed in the subject application have become commercially successful.

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Respectfully submitted,


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